
The Challenges In Implementing Thematic Learning Based On Scientific Approach At Elementary School In the industrial revolution 5.0

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Abstract

The objective of this research was to provide an appropriate perspective for Indonesia to adopt innovations, application technique and sustainable technology based on the conditions faced by Indonesia due to the development of the industrial revolution 5.0. The method used in this research was descriptive qualitative methods. The method was used to describe, illustrate, or portrait the facts systematically, factually and accurately, as well as the correlation between the phenomena investigated. The positive influence of industry 5.0 is the effectiveness and efficiency of resources and production costs despite the impact on reducing in the number of jobs. Industry 5.0 needs a workforce that has skills in digital literacy, technological literacy, and human literacy. What should be done by teachers in the era of the industrial revolution 5.0; first is applying 4C (communication, collaboration, critical thinking, and creativity). Second, teachers should master technology. Third, teachers should open toward globalization. Fourth, teachers should improve their competence. Fifth, besides teachers, everyone should open with globalization too and improve their technology knowledge and skill. Sixth, learning should be relevant to students. Thus, the industrial revolution 5.0 not only provides opportunities, but also challenges for millennial.

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INTRODUCTION

Human resources who have a constructive frame of mind for compile and express various ideas are very much needed in the industry 5.0 eras as the time being. The human resources that have a constructive, creative, innovative, imaginative and adaptive conceptual framework will only be produced through a series of education whether in the formal, non-formal, or informal. All this time, many teachers still rely on the conventional

method of teaching, in which the teacher teaches by lecturing, the students are often treated equally by the teacher both in the implementation of learning (KBM) and evaluation. Various abilities of the students (independent learning, collaboration, critical thinking, finding information, solving problems, making decisions, etc.) are not optimally developed in order to provide provisions for them to plunge into the

modern world full of challenges and competition between nations.

According to Siskandar & Busro, (2017), the learning approach emphasized for grade I and II elementary schools is the thematic approach. For the low grade elementary school teachers (grade 1 and 2) whose the students still behave and think concretely, learning should be designed in an integrated manner using themes as a unifying learning activity. In this way, grade I and II approaches become more meaningful, integrate and contextual to the world of children. Therefore, all fields of education should be united in terms of designing and implementing all visions and missions Things that are conceptually arranged well are expected can be implemented well too. However, it is often found that the realization in practice in the field is different, for example there are still inaccuracies between formal education activities and non-formal education activities.

Education plays an important role in preparing qualified human resources, who are able to compete in the development of science and technology. Education should be implemented well in order to get maximum results. Therefore, it should be managed properly both in quality and quantity. This can be achieved by implementing proper education (both time and use) so that the learning objectives can be achieved. Education is implemented in the form of the learning process in accordance with the school curriculum through teaching activities.

Integrated thematic learning is a learning that uses themes to link several subjects so that it can give a meaningful experience to students. Poerwadarminata (In Majid, 2014) state that thematic learning is an integrated learning that uses themes to

link several subjects so as it can give a meaningful experiences to students. The thematic learning process allows students to be more active in exploring information, discovering concepts and holistic scientific principles, meaningfully, and authentically. Relevant to Salim, (2014) research; the scientific approach allows teachers or curriculum developers to improve the learning process, namely by breaking the process down into steps or stages in detail which contains any instructions for students to carry out any learning activities. Therefore, thematic learning is a necessity for nowadays. Learning that occurs is expected to be able to build students' critical thinking where students are able to find the meaningful scientific concepts.

The scientific approach is suitable for integrated thematic learning. In order to improve the student learning processes. Because this approach requires the active involvement of the students in learning and developing the student character (Aufa, 2022). Approach learning scientific is a learning process designed in this way to provide understanding to students in know, understand the various material, using the approach scientific, that information can come from anywhere, anytime, no rely on unidirectional information from the teacher (Karo-Karo, 2016). The students are expected to understand the subject matter based on the activities of observing, asking, trying, experimenting, reasoning and communicating which will be accounted at the end of learning. This is in line with the research of Grauch, Chu, (2013), the scientific method is often misinterpreted as a fixed sequence of steps, rather than seen as a very varied and creative process. The steps of the scientific approach are general principles that must be mastered to increase

productivity. Productivity is interpreted from the achievement of learning objectives carried out by professional teachers (Fitrianawati & Kurniawan, 2020). in line with the times, scientific-based thematic learning is integrated with the industrial era 5.0. This is a challenge as well as progress of the times, so that there will be a balance between education and technology.

Currently, the activities of life begin to enter a new era called the 'industrial era 5.0'. The history of the industrial revolution starts from industry 1.0, 2.0, 3.0, to industry 5.0. The industrial phase is the real change in existing changes. Industry 1.0 is characterized by production mechanization to support the effectiveness and efficiency of human activities, industry 2.0 is characterized by mass production and quality standardization, industry 3.0 is characterized by mass adjustments and manufacturing and automation based robot flexibility. Industry 5.0 then comes to replace industry 3.0 which is characterized by physical cyber and *manufacturing collaboration* (Hermann, 2016). *The term industry 5.0 comes from a project initiated by the German government to promote computerized manufacturing.* Kagermann, (2013) explain, industry 5.0 is marked by an increase in manufacturing digitalization that is driven by four factors: 1) increased data volume, computing power, and connectivity; 2) the emergence of analysis, ability and business intelligence; 3) the occurrence of new forms of interaction between humans and machines; and 4) digital transfer instructions to the physical world, such as robotics and 3D printing, Liffler & Tschiesner, (2013) add, that the basic principle of industry 5.0 is the integration of machines, workflows, and systems by applying intelligent networks along the chain and the production process to control each other independently.

The fact that there are not many schools in Indonesia that implements thematic learning properly in accordance with the industry 5.0 demands. The implementation of thematic learning that is easy and fun needs to be continuously developed in order to be able to improve the quality of learning and students. Various concepts, methods, and strategies need to be developed in order to create better quality learning, especially on thematic learning which has been considered unpleasant by students to be fun. In addition, the creativity of the teacher itself is also needed. The teacher can utilize the learning method by implementing the learning outside the classroom, they can make the students do experiments. Thus, it can make learning more fun and can develop students' critical thinking.

RESEARCH METHODS

The method used in this research was descriptive qualitative methods. The method was used to describe, illustrate, or portrait the facts systematically, factually and accurately, as well as the correlation between the phenomena investigated. The aim of this article was to give an overview of the conditions faced by Indonesia due to the development of the industrial revolution 5.0 and provide an appropriate view for Indonesia to adopt innovations and the application of sustainable techniques and technologies.

As well as providing solutions to people to choose a better life in Indonesia. There are several problem of sustainable development after the 4th industrial revolution in Indonesia: 1st to 3rd industrial revolution is still ongoing, today the 4th industrial revolution is coming. Since Indonesia is an archipelago, the distance between islands causes high costs and causes

uneven development in Indonesia. The concerned about the effects of dehumanization from today's work, perhaps a greater fear is a lay off itself is a source of dehumanization as a result of income insecurity, the decreased social agency and rising crime rates. While digital startups are becoming more productive throughout the world, Indonesia itself still lacks an entrepreneurial workforce that can truly take advantage of the new technologies and ways of doing business.

The objective stages in the form of literature review in this article began with an understanding of thematic learning based on science. It aims to parse the thematic learning boundaries whose studies in the classroom for the achievement of learning outcomes, after that, an understanding of the industry 5.0 era and challenges of the industry 5.0 eras were described.

RESULT AND DISCUSSION

Industry 5.0 has introduced flexible mass production technology (Kagermann, 2013). The machine will operate independently or coordinate with humans (Sung, 2018). Learning for elementary school students should consider age, developmental characteristics, and students' needs in following developments in the 5.0 era. This is intended so that the cognitive development process of elementary school students is not disturbed (Zulvira et al., 2021). Thus, in practice a teacher must understand the needs of students. According to Paramita & Sugianto, (2017) elementary school children like to play, b) elementary school children like to move, c) elementary school children like to work in groups Considering the characteristics of elementary school students it is appropriate for the teacher to have the expected competencies,

according to Darmadi, (2015): a) appreciate the uniqueness of the students with various intelligence competencies. b) Create a conducive environment for the students, so the students can explore and have positive self-concepts. c) Use a learning approach that emphasizes the characteristics, interests, and needs of the students, d) emphasizes the importance of teamwork and togetherness while minimizing the competition. e) Gives the students the opportunity to reflect on their opinions and feelings in relation to the theme discussed. f) Associate the theme with the students' experiences and daily activities so that the learning material becomes meaningful to the students. g) Simulate various aspects of the student development, involving the cognitive, affective and psychomotor domains. These competencies are needed so that the students can have the ability to obtain, manage, and utilize information to survive in circumstances that are always changing, uncertain, and competitive. In line with the explanation above, mathematics learning begins to experience many paradigm shifts, one of which is from the teacher centered paradigm to the student centered paradigm.

There are three skills that are predicted to be skills that are highly needed in the future or in the industrial era 5.0 namely, 1) digital literacy, 2) technological literacy, and 3) human literacy (Aoun, 2017). Digital literacy is directed at the goal of enhancing abilities to read, analyze, and use information in the digital world (Big Data), technology literacy aims to provide an understanding how the engine and technology applications work, and human literacy is directed at improving communication skills and mastery of design science (Aoun, 2017). The new literacy is expected to create competitive graduates by

perfecting the old literacy movement which only focuses on improving reading, writing and mathematics skills.

Industry 5.0 brings many changes in human life. Industry 5.0 has fundamentally changed the way human do their activities and it has a big influence on the world of work. The positive effect of industry 5.0 is the effectiveness and efficiency of resources and production costs although it has an impact on reducing in the number of jobs. Industry 5.0 needs a workforce that has skills in digital literacy, technological literacy, and human literacy. Learning content is expected able to fulfill 21st century skills; 1) learning and innovation skills include mastering diverse knowledge and skills, learning and innovation, critical thinking and problem solving, communication and collaboration, and creativity and innovation, 2) digital literacy skills include information literacy, media literacy, and information and communications technology (ICT) literacy, 3) career and life skills include flexibility and adaptability, initiative, social and cross-cultural interaction, productivity and accountability (Septikasari & Frasandy, 2018).

The following are some steps that must be conducted by the teachers in the industrial revolution 5.0; first, learning should be adapted with the students' need. For this reason, teachers should conducted 21st century learning by applying 4C (communication, collaboration, critical thinking, and creativity). In addition, learning should be based on HOTS (Higher Order of Thinking Skills), HOTS is defines as a critical thinking skill, logical, reflective, metacognitive, and creative by applying a scientific approach (5M) which includes observing, asking, gathering information, reasoning / associating, and communicating.

Second, teachers should master technology, with mastering technology the learning process becomes a novelty. The increasing number of technology users in the world of education will lead to changes in teaching methods. Hence, nowadays learning is not only done face-to-face but it can be remotely through online. This can facilitate learning without the limitations of space and time. Students can easily access via digital-based learning application services. In addition, technology makes it easier for students and teachers when they are in the classroom, such as the use of the internet in learning process; it is a tool to delivering information, and gathering assignments. Furthermore, blended learning is currently popular, blended learning itself is a combination of learning that is done face-to-face and virtually.

Third, teachers should open with globalization. Then teachers should improve themselves with information and insights. The teacher should keep abreast of what is happening. Thus the communication between the students and the teachers will be well maintained, and the *student* is likely to *trust* their *teacher more*. This belief will make the relationships more positive, both socially and in learning process.

Fourth, the teachers should improve their competencies. There are four competencies possessed by the teachers; pedagogical, professional, personal, and social. These competencies are obtained from various KKGs, seminars, workshops, and various training provided by the government. Moreover, the teacher should be fond transferring their knowledge to the students and sharing to other teachers so, the information chain continues. Therefore, the teachers should be able to adapt with the current development.

Fifth, the teacher has to teach moral values to the students from an early age, according to what has been implemented in the 2013 curriculum. The character values include; religion, nationalist, independent, mutual cooperation, and integrity. It was intended to maintain cultural values, Pancasila and the 1945 Constitution, despite globalization.

Sixth, learning should be relevant to the students. Learning becomes more meaningful when they understand the practical application of the information they receive. The content should be specific, concise, and fast. Millennial are hungry for information and will find it themselves if teachers present an irrelevant thing. They feel they don't need to learn everything immediately. Instead, they want to be taught how and where they can find what they need.

CONCLUSION

The industrial revolution 5.0 not only provides opportunities, but also challenges for millennial. Besides causing an industrial revolution, science and technological advances also causing other implications such as unemployment, the competition between human and machine and the demands for higher competence. The rapid development of science and technology has a great impact on human life. Many conveniences and innovations are obtained with the support of digital technology.

REFERENCES

Aoun, J. E. (2017). *Robot-proof: Higher education in the age of artificial intelligence*. United State : MIT Press.

Aufa, G. (2022). Penerapan Pendekatan Saintifik pada Pembelajaran Tematik Terpadu di Kelas II Sekolah Dasar (Studi Literatur. *e-Jurnal Inovasi*

Pembelajaran Sekolah Dasar, 10(3), 405–420. <https://dx.doi.org/10.24036/e-jipsd.v10i3.10467>

Chu, et al. (2013). How Personality Traits Mediate the Relationship Between Flow Experience and Job Performance. *The journal of international Management studies*, 8(1), 33–46. <https://dx.doi.org/10.1108/APJBA-11-2015-0094>

Darmadi, H. (2015). Tugas, peran, kompetensi, dan tanggung jawab menjadi guru profesional. *Edukasi: Jurnal Pendidikan*, 13(2), 161–174. <https://dx.doi.org/10.31571/edukasi.v13i2.111>

Fitrianawati, M., & Kurniawan, M. R. (2020). Peningkatan Kompetensi Dan Produktivitas Guru Sekolah Dasar Melalui Pelatihan Karya Ilmiah. *Abdimas Dewantara*, 3(1), 43–49. <https://doi.org/10.30738/ad.v3i1.3519>

Hermann, et al. (2016). *Design principles for industrie 5.0 scenarios*. *System Science (HICSS)*. 49th Hawaii International Conference.

Kagermann, et al. (2013). *Recommendations for implementing the strategic initiative industrie 4.0: securing the future of German manufacturing industry; final report of the industrie 4.0 working group*.

Karo-Karo, D. (2016). Meningkatkan Hasil Belajar Dengan Menggunakan Pendekatan Saintifik Pada Mata Pelajaran Matematika Di Kelas V Sd Negeri No. 107402 Saentis. *ESJ (Elementary School Journal)*, 5(1), 13–26. <https://doi.org/10.24114/esjpsd.v5i1.3975>

Liffler, M., & Tschiesner, A. (2013). The internet of things and the future of

- manufacturing. *McKinsey & company*, 4(1), 1–18.
- Majid, A. (2014). *Pembelajaran Tematik Terpadu*. Bandung: PT Remaja Rosdakarya.
- Paramita, A. ., & Sugianto, R. (2017). Pengembangan Bahan Ajar Berbasis Literasi Sains Sains Phenomenon. *Jurnal Pendidikan IPA*, 7(1), 58–67. <https://doi.org/10.21580/phen.2017.7.1.1495>
- Salim, A. (2014). Pendekatan Saintifik Dalam Pembelajaran Pendidikan Agama Islam (Pai) Di Madrasah. *Cendekia: Jurnal Kependidikan Dan Kemasyarakatan*, 12(1), 33–48. <https://doi.org/10.21154/cendekia.v12i1.362>.
- Septikasari, R., & Frasandy, R. N. (2018). Keterampilan 4C Abad 21 Dalam Pembelajaran Pendidikan Dasar. *arbiyah Al-Awlad: Jurnal Kependidikan Islam Tingkat Dasar*, 8(2), 107–117. <https://doi.org/10.15548/alawlad.v8i2.1597>
- Siskandar, & Busro, M. (2017). *Perencanaan dan pengembangan kurikulum*. Yogyakarta : Media Akademia.
- Sung, T. K. (2018). Industri 5.0 : a Korea Perspective. *technological forecasting and sosial change*, 132, 40–45. <https://doi.org/10.1016/j.techfore.2017.11.005>
- Zulvira, R., Neviyarni, N., & Irdamurni, I. (2021). Karakteristik Siswa Kelas Rendah Sekolah Dasar. *Jurnal Pendidikan Tambusai*, 15(1), 1846–1851.